

David Garrett



Matt Blunt, Governor • Doyle Childers, Director

## DEPARTMENT OF NATURAL RESOURCES

[www.dnr.mo.gov](http://www.dnr.mo.gov)

June 26, 2008

CERTIFIED MAIL – 7004 1160 0000 8176 7109  
RETURN RECEIPT REQUESTED

Mr. Gary A. Fahl  
Vice President  
Environmental, Safety, and Security  
Modine Manufacturing Company  
1500 DeKoven Avenue  
Racine, WI 53403-2552

RE: Resource Conservation and Recovery Act Facility Investigation Report, Modine  
Manufacturing Company  
Camdenton, Missouri, April 10, 2008  
EPA ID# MOD062439351

Dear Mr. Fahl:

The Missouri Department of Natural Resources has reviewed the "RCRA Facility Investigation Report, Modine Manufacturing Company, Camdenton, Missouri" submitted to the department on April 10, 2008. In support of the Missouri Department of Natural Resources' Hazardous Waste Program, the U.S. Environmental Protection Agency has provided support in reviewing the portions of the document relating to risk assessment.

Modine must address the enclosed comments, in accordance with the Corrective Action Order on Consent, within 45 days of receipt of this letter. If you have any questions regarding this letter, please contact me at the Missouri Department of Natural Resources, Hazardous Waste Program, P.O. Box 176, Jefferson City, MO 65102-0176, or by phone at (573) 751-3553, or by e-mail at [bruce.stuart@dnr.mo.gov](mailto:bruce.stuart@dnr.mo.gov).

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Mr. Gary A. Fahl

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If you have specific questions regarding the Human Health Risk Assessment comments please contact Mr. David Garrett, with the U.S. Environmental Protection Agency, at (913) 551-7159, or by e-mail at David.Garrett@epamail.epa.gov.

Sincerely,

HAZARDOUS WASTE PROGRAM



R. Bruce Stuart, P.E., R.G.  
Chief, Corrective Action Unit

RBS:ckm

Enclosures

c: Mr. Dan Price, CH2MHILL  
Mr. David Garrett, U.S. EPA, Region VII ✓  
Ms. Shelley Woods, Attorney General's Office  
Southwest Regional Office

## GENERAL COMMENTS

1. The Resource Conservation and Recovery Act (RCRA) Facility Investigation Report (RFI) states that the facility has been used for industrial purposes since 1967 and will continue to be zoned as industrial land use in the future. However, the RFI Report was completed prior to Modine Manufacturing Company's corporate headquarters announcing the closure of the Camdenton, Missouri, plant. Modine should address how closure of the Camdenton plant will affect future land use of the site. In light of the plant closure, Modine may want to evaluate a potential future residential scenario and any other scenarios that may be appropriate for future site use as part of the risk assessment. The report should also discuss any current deed restrictions or zoning ordinances designating the site as industrial.

Beginning January 1, 2008, Missouri implemented the Missouri Environmental Covenants Act. Institutional controls restricting the site use to non-residential shall be established in an environmental covenant that meets the requirements of the Missouri Environmental Covenants Act, RSMo, Section 260.1000 through 260.1039. Once the content is agreed to, the environmental covenant shall be filed with the county recorder of deeds and proof of filing provided to the Hazardous Waste Program.

The department is finalizing a Model Restrictive Covenant incorporating the Missouri Environmental Covenants Act. Modine's institutional controls must conform to this document. A working draft of the "model" environmental covenant to be used in development of a site-specific environmental covenant is enclosed. An electronic version of this document will also be forwarded for your use.

2. Modine's approach to evaluating the vapor intrusion pathway is inconsistent. Although the indoor air pathway has been addressed previously through the collection of indoor air samples, the risk assessment re-evaluates the vapor intrusion into indoor air pathway using the Johnson & Ettinger (J&E) model for soils. Modine does not provide rationale explaining why the results from the 2003 indoor air sampling, used to make an environmental indicator determination, were not assessed quantitatively in the risk assessment. Troubling this issue, is that while the risk assessment mentions the significant uncertainties with using the J&E model for soil contamination, it fails to mention that the concentrations of contaminants detected in indoor air are significantly greater than (10-1000 times) the concentrations predicted by modeling. No other information has been provided to suggest that the 2003 results are not representative of current conditions.

The 2003 data collected for the environmental indicator evaluation was evaluated using site-specific parameters based on the current use (i.e., light industrial) of the manufacturing building. In light of the plant closure, it is difficult to justify that the site specific parameter will be representative of conditions in the future. Therefore, the previous indoor air data should be re-evaluated using default parameters that account for future exposure.

Furthermore, Modine has applied occupational exposure limits (i.e., Occupational Safety and Health Administration permissible exposure limits) to assess measured data, and then used the U.S. Environmental Protection Agency risk assessment approaches to evaluate health risks for modeled data despite the fact that the exposure scenario has not changed. Also, regardless of their applicability,

occupational exposure limits (e.g., permissible exposure limits) cannot be used to characterize health risks in the EPA human health risk assessments. The applicability and use of those values is a risk management decision.

Assuming that conditions at the site have not changed in a manner that would affect the vapor intrusion pathway and/or there were no background sources of contaminants at the time of sampling, the J&E Model significantly underestimates exposure concentrations. Therefore, unless information is available to suggest otherwise, the use of the modeling over real measurement data is not supported and the risk assessment should use the 2003 indoor air data.

### **SPECIFIC COMMENTS**

1. **Executive Summary, Page iii, Paragraph 1, Last Sentence:** “Action Order on Consent” in this sentence the wording should be changed to “Corrective Action Order on Consent.”
2. **Section 2.6, Land Use, Page 2-3:** This section states that this property has been used for industrial purposes since 1967 and will continue to be zoned as industrial use for the foreseeable future. However, as discussed in general Comment #1, the RFI Report was completed prior to Modine Manufacturing Company’s corporate headquarters announcing the closure of the Camdenton, Missouri, plant. Modine should address how the closure of the Camdenton Plant will affect future land use of the site.
3. **Section 3.2.2.1, Investigations and Corrective Action, Page 3-5:** The appropriate RCRA terminology for removal of soil west of the building is “interim measures” rather than “Corrective Action.” “Corrective Action” implies the final remedy for the site has undergone public participation and a final remedy decision has been made. The goal of interim measures is to control or abate imminent threats to human health and the environment from releases at RCRA facilities. Interim measures can be implemented at any time during the corrective action process. It is common for interim measures to be selected as the final remedy for a site. The text should be revised accordingly.
4. **Table 4-1, Soil Analytical Results Representative of Current Onsite Conditions:** This table should cite the date and source of screening levels as well as which screening levels are used (i.e., industrial indoor worker without dermal contact).
5. **Section 6.2.2.1, Step 1: Frequency of Detection Evaluation, Page 6-2:** Although it does not impact the risk assessment (i.e., all chemicals with low detection frequencies were below screening levels), please note that *Risk Assessment Guidance for Superfund: Human Health Evaluation Manual (RAGS) (Part A)* provides a 5 percent detection frequency as an example, not a guideline for screening chemicals of potential concern from quantitative risk assessment. Several other criteria outlined in Section 5.9.3 of Risk Assessment Guidance for Superfund (RAGS) Part A must be met when eliminating chemicals of potential concern based on frequency of detection.
6. **Section 6.2.2.2, Step 2: Risk Based Screening Value Comparison, Page 6-3:** The risk assessment evaluates soils between 0 and 3 feet below ground surface (bgs) as surface soils. Per EPA guidance, surface soils under an outdoor industrial worker scenario are typically defined as soils between 0 and 2 feet bgs (EPA, 1996 and 2002).



7. **Section 6.3.1, Evaluation of Exposure Pathways and Identification of Receptors, Page 6-4:** The trespasser scenario is considered incomplete given that site access is limited by a 6-foot tall fence and that the fence will remain intact in the future. Although the health risks for the trespasser scenario would be more than accounted for under other exposure scenarios, this pathway cannot be considered incomplete due to a fence. As discussed in the text, the fence limits access, but it does not entirely prevent access. Also, in light of the recent announcement to close the plant, the presence and condition of this fence in the future can only be speculated. The risk assessment should state that this exposure scenario is complete and address the pathway qualitatively (i.e., risks are accounted for under the industrial worker scenario).
8. **Section 6.3.3, Exposure Pathways to be Quantified, Page 6-4:** The text in this section does not state whether the future industrial worker is an outdoor or indoor worker. However, with the exception of the soil ingestion rate and exposure frequency, the risk assessment evaluates an outdoor worker by accounting for the dermal contact and inhalation of volatiles outdoors exposure pathways, which are typically not evaluated in the indoor worker scenario. The soil ingestion rate of 50 mg/day and exposure frequency of 250 days/year are default values for the indoor worker (EPA, 2002). Modine should revise the risk assessment so that it uses a soil ingestion rate of 100 mg/day and exposure frequency of 225 days/year to address the reasonable maximum exposure for the outdoor worker. Modine should also add language to the text that states that the risk assessment evaluates the future outdoor industrial worker scenario. Additional language can be added to the text that states that the outdoor worker health risks will account for the indoor worker scenario (i.e., soil ingestion) with the exception of the vapor intrusion into indoor air pathway.
9. **Section 6.3.4, Quantification of Exposure, Page 6-5:** The last sentence uses exposure concentration, exposure frequency, and exposure duration as examples of upper-bound values that EPA uses to quantify exposure. As discussed in Section 6.3.5.1, EPA recommends using an upper confidence limit (UCL) of the arithmetic mean for exposure concentrations, not an upper-bound value, such as the ones used for exposure frequency and duration. Please remove exposure frequency from the example and replace it with another exposure parameter that is based on an upper-bound value, not a statistical average.
10. **Section 6.3.5.2, Calculation of Exposure Point Concentrations for Ambient Air, Page 6-5:** This section states that trichloroethylene (TCE) in ambient air was modeled using soil exposure point concentrations in the 0-to-3-foot and 0-10-foot intervals. Per EPA guidance, the inhalation of volatiles outdoors should account for the entire column of contaminated soil (EPA, 1996 and 2002). Therefore, the inhalation exposure pathways (industrial worker) should account for the entire depth of contamination, not specific intervals. The risk assessment should be revised accordingly.

This section also states that a particulate emission factor (PEF) was used to evaluate TCE in ambient air and the site-specific dispersion factor (Q/C) was obtained from the Missouri Department of Natural Resources' Missouri Risk Based Corrective Action (MRBCA) technical guidance. First, a PEF need not be estimated for volatile compounds, such as TCE. Fugitive dust emissions are of general concern for the top 2 centimeters of soil where volatile contaminants are likely to be depleted (EPA, 1996). For this reason, the risk assessment should not evaluate exposure to TCE and other volatile compounds via fugitive dust emissions. Furthermore, the risk assessment should derive site-specific Q/C values consistent with EPA

guidance or use default Q/C values of 68.18 and 14.31 g/m<sup>2</sup>-s per kg/m<sup>3</sup> for the industrial/commercial and construction worker scenarios, respectively, (EPA, 2002). As a reminder, the default Q/C<sub>sa</sub> value for the construction worker scenario cannot be modified for climatic zone (only source size), unless the site-specific value is derived by running EPA's SCREEN3 dispersion model (EPA, 2002). The dispersion correction factor (F<sub>D</sub>) used in estimating the volatilization factor is applicable to the default climatic data used to estimate the default Q/C<sub>sa</sub>.

11. **Section 6.3.5.3, Calculation of Exposure Point Concentrations for Indoor Air, Page 6-6:** The site-specific J&E modeling uses a depth to top of contamination of 7 feet. Per Appendix A-3, a depth of 7 feet represents the average depth to residual contamination within the building footprint. Regardless of other comments on this pathway, the EPA does not agree with Modine's approach and use of this parameter. First, contamination has been detected at less than 2 feet below the building's foundation, which is expected given the type of release (i.e., surface) that occurred at SWMUs 26 and 31. Second, the data sets used to estimate the average soil depth do not appear to be comparable. Based on the data and discussion provided in the RFI, the same depth intervals were not consistently sampled at each sampling location. Shallow soil samples were collected at some locations, while deep samples were collected at others. In fact, the first depth interval sampled at some locations (as indicated in Table 4-1) were at depths greater than 8 feet bgs. If samples were not collected from shallower soil intervals, then the deeper intervals cannot be used to estimate an average depth to contamination. In addition, the depth intervals used to estimate the average depth range from a couple feet to several feet. The risk assessment does not specify the exact depth that was used from each interval to estimate the average. Unless Modine can provide discussion and supporting data to justify the use of 7 feet, the shallowest soil interval should be used as an input to the J&E Model. EPA also strongly recommends that Modine evaluate whether there is sufficient mass of volatile organic compounds in the subsurface below the building to generate the long-term levels in indoor air that modeling predicts.
12. **Section 6.4, Toxicity Assessment, Page 6-7:** The entire toxicity value hierarchy provided in Office of Solid Waste Emergency Response Directive 9285.7-53 should be listed, rather than listing only those sources that were specifically used in the risk assessment.
13. **Section 6.6.1, Toxicity Values for TCE, Page 6-9:** A majority of the discussion tends to focus on the sources of the TCE slope factors rather than the uncertainties associated with the TCE toxicity values. Note, a discussion on the TCE toxicity values used to characterize health risks is not provided in the toxicity assessment. Modine should revise the risk assessment so that the toxicity assessment discusses the sources of TCE toxicity values.

Also, the second paragraph states, "Mechanisms of TCE-induced adverse health effects and carcinogenesis are very complex and a great deal of uncertainty is considered to exist with these draft values; these values are considered highly conservative among the risk assessment community." This passage should be removed from the assessment since much of it contains statements of opinion rather than fact. It also does not specifically discuss the uncertainties with TCE toxicity values. If uncertainties with the 2001 draft assessment are discussed, then this section should provide a balanced discussion on the strengths and limitations of the assessment. Uncertainties with the CalEPA values should also be discussed. Keep in mind that the draft assessment and toxicity values are based on more current science than CalEPA's TCE toxicity

values. Information on the strengths and limitations of the 2001 draft assessment can be obtained from peer review comments provided by EPA's Science Advisory Board and the National Academy of Science.

14. **Section 6.6.2, Indoor Air Modeling, Page 6-10:** This section should provide a detailed discussion on the development of the 2003 Site-Specific Screening Levels. The RFI should also include a table showing the input parameters, calculations, and results.
15. **Section 6.6.2, Indoor Air Modeling, Page 6-10:** This section mentions the uncertainties with using the J&E modeling for soils, but fails to mention that the concentrations detected in indoor air in 2003 are 10-1000 times greater than the levels predicted by modeling. Although real measurements should be used to characterize health risks in the risk assessment, the uncertainties regarding the predictive power of the J&E model should be discussed within the context of the results of the indoor air samples collected in 2003.

This section states that concentrations in indoor air are below the calculated comparative screening levels for industrial workers. Although concentrations are below the site-specific screening levels calculated for the environmental indicator evaluation, it is difficult to justify that the site-specific parameter will be representative of conditions in the future. Therefore, this statement should be removed from the risk assessment and the 2003 indoor data should be re-evaluated using default parameters to account for future exposure.
16. **Section 7, Ecological Risk Assessment, Page 7-1, Second Paragraph, Seventh Sentence:** This sentence states "If the answer to any question on the checklist is negative, no further ecological evaluation is necessary." This should be changed to state "If the answer to all questions is negative, no further ecological evaluation is necessary."
17. **Table 7-1, Results of MRBCA Appendix F Checklist A and Table 7-2, Results of MRBCA Appendix F Checklist B:** The answers for the Ecological Risk Assessment, Checklist A and Checklist B do not provide sufficient justification or documentation. The answer for each question and sub-question should be accompanied with the rationale for making the associated "yes" or "no" determination. The checklist should reference sources and include a copy of any maps used to make these determinations.
18. **Table 7-1 Results of MRBCA Appendix F Checklist A and Table 7-2 Results of MRBCA Appendix F Checklist B:** Question 4 on Table 7-1 and question 7a on Table 7-2 are identical questions. Question 4 is answered "yes" and question 7a is answered "no." Please explain why the same question has two different answers.
19. **Appendix A-1: RAGS Part D Tables, Table 1, Selection of Potentially Complete Exposure Pathways:** As stated in General Comment #1, the future use of the site is uncertain due to the closure of the Camdenton Plant. Therefore, residential use should be evaluated as a potential pathway for future use.
20. **Appendix A-1: RAGS Part D Tables, Tables 3.1 through 3.3, Reasonable Maximum Exposure:** Unless a footnote is provided that explains the difference in the data sets used to estimate the average and the UCL of the mean, EPA recommends providing the arithmetic mean

of all sample results including non-detect results using the  $\frac{1}{2}$  detection limit method. Several of the 95 percent UCLs of the mean, which account for non-detect results, are less than the average concentration of detected samples.

21. **Appendix A-1: RAGS Part D Tables, Table 6.1, Cancer Toxicity Data – Oral/Dermal:** This table provides CalEPA's weight of evidence/cancer guideline description of "2A" for TCE, but does not define the classification. This table also states that an EPA weight of evidence/cancer guideline description is not available. The 2001 draft assessment does provide a cancer guideline description that is consistent with EPA's 2005 Cancer Guidelines. Please add the following language to this table and Table 6.2:

"According to the 2001 draft TCE Assessment, TCE is highly likely to produce cancer in humans."

Per the Integrated Risk Information System's profile for 1,1,1-trichloroethane (1,1,1-TCE), please provide the following cancer guideline description:

"Inadequate information to assess carcinogenic potential."

22. **Appendix A-3: Johnson and Ettinger Model Exposure Assumptions:** Except for the input and intercalculation worksheets for 1,1,1-trichloroethane, the appendix does not contain the output worksheet for 1,1,1-trichloroethane and input and output worksheets for TCE and vinyl chloride. This information should be provided in the final risk assessment.



## **REFERENCES**

- CalEPA. 2007. Toxicity Criteria Database. Office of Environmental Health Hazard Assessment. Available on-line at <http://www.oehha.ca.gov/risk/ChemicalDB/index.asp>.
- U.S. EPA. 1996. Soil Screening Guidance: Technical Background Document. Office of Emergency and Remedial Response, Washington, D.C. EPA/540/R95/128.
- U.S. EPA. 2001. Trichloroethylene Health Risk Assessment: Synthesis and Characterization, External Review Draft. Office of Research and Development, Washington, D.C. EPA/600/P-01/002A.
- U.S. EPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Office of Solid Waste and Emergency Response, Washington D.C. 9355.4-2
- U.S. EPA. 2003. Human Health Toxicity Values in Superfund Risk Assessments. Office of Solid Waste and Emergency Response, Washington D.C. OSWER Directive 9285.7-53.